

## Questions and Answers Regarding the Consideration of Indirect and Cumulative Impacts in the NEPA Process

### Introduction

The FHWA and other Federal agencies' responsibility to address and consider direct, indirect, and cumulative impacts in the NEPA process was established in the Council of Environmental (CEQ) Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (40 CFR §§ 1500-1508). To provide the proper context on this subject and to fully appreciate the discussion in these *Question and Answers*, we first need to examine some basic principles of the National Environmental Policy Act (NEPA) (42 U.S. C. 4321 et seq.).

In 1970, NEPA introduced a national environmental policy into the normal business practices of the Federal government. The law intentionally focused on Federal activities with respect to its goal for a sustainable environment balanced with other essential needs of present and future generations of Americans. NEPA did not alter the missions of Federal agencies. Instead, it established a supplemental mandate for Federal agencies to examine the potential environmental consequences of their proposals, consult with other agencies, document the analysis, and make the information available to the public prior to making a decision.

The environmental policy established in NEPA (*Section 101*) is supported by a set of "action forcing" provisions (*Section 102*) that form the basic framework of Federal decisionmaking known as the NEPA process. While NEPA established the basic framework for integrating environmental considerations into Federal decisions, it did not provide the details of a process for Federal agencies to follow. Federal implementation of NEPA was the charge of the CEQ, which interpreted the law and addressed the action forcing provisions in the form of regulations and guidance, the bulk of which is focused on the preparation of environmental impact statements (EIS). CEQ defined categorical exclusions (CE) and environmental assessments (EA) but the specifics were left for the agencies to address in individual supplemental regulation and guidance.

Decisions resulting from NEPA litigation have influenced the evolution of NEPA implementation. While the general environmental protection provisions of NEPA may seem explicit and clear to some, courts have interpreted the mandates of the law as "procedural" rather than "substantive", Robertson v. Methow Valley Citizens Council, 490 U.S. 332, 350 (1989). This means that NEPA directs the way in which Federal Agencies must make decisions concerning proposals that adversely impact the environment but does not require a particular conclusion or direct what decision must be made. The courts concluded that Federal agencies must take a reasonable "hard look" at their proposals in light of available information, analysis, and the potential for environmental impacts in making informed decisions to implement an action or alternative, Kleppe v. Sierra Club, 427 U.S. 390 (1976). Inherent in the hard look provision is the necessity to consider and examine the appropriate issues using the

most appropriate expertise and methodology available.

Understanding the basic intent of NEPA, the provisions of the CEQ regulations, and the standards established in case law is essential to overall NEPA compliance. Where indirect and cumulative impacts are a concern it must also be recognized that other statutory or regulatory mandates include secondary, indirect, and/or cumulative impact requirements. This is briefly discussed in the answer to *Question 11*. These terms have different meanings and procedural expectations, with respect to other regulations and their subject resources, from those of the overall NEPA process. Two examples include the regulations implementing the Endangered Species Act (ESA) and Section 404 of the Clean Water Act (CWA). These differences are important in the NEPA project development process and overall project decisionmaking process. These *Questions and Answers* primarily address indirect and cumulative impact considerations in the context of the NEPA process.

### **Questions and Answers**

#### **1. How and where are direct, secondary, indirect, and cumulative effects and impacts defined?**

The CEQ regulations (40 CFR §§ 1500 -1508) define the impacts and effects that must be addressed and considered by Federal agencies in satisfying the requirements of the NEPA process. This includes direct, indirect and cumulative impacts:

**Direct effects** are caused by the action and occur at the same time and place. (40 CFR § 1508.8)

**Indirect effects** are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems. (40 CFR § 1508.8)

**Cumulative impact** is the impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. (40 CFR § 1508.7)

The terms “effect” and “impact” are used synonymously in the CEQ regulations (40 CFR §1508.8). “Secondary impact” does not appear, nor is it defined in either the CEQ regulations or related CEQ guidance. However, the term is used in the FHWA’s *Position Paper: Secondary and Cumulative Impact Assessment In the Highway Project*

*Development Process* (April, 1992) but is defined with the CEQ definition of indirect impact (40 CFR § 1508.8). Some authors on this subject have distinguished secondary impacts from indirect impacts, while others; including the FHWA have used the terms interchangeably. For purposes of this guidance, secondary and indirect impacts mean the same thing.

## **2. Are there substantive differences between indirect impacts and cumulative impacts and requisite NEPA requirements?**

The terms indirect impact and cumulative impact are often used as if they mean the same thing. However, there are important differences in the meaning and requirements related to indirect impacts and cumulative impacts in the NEPA process. Understanding the distinctions is the first step to ensuring that the relative requirements are given appropriate and adequate treatment in the NEPA process and subsequent environmental documentation. The differences and relationships are highlighted in the following discussion, examples, and figures.

A **cumulative impact** includes the total effect on a natural resource, ecosystem, or human community due to past, present, and future activities or actions of Federal, non-Federal, public, and private entities. Cumulative impacts may also include the effects of natural processes and events, depending on the specific resource in question. Cumulative impacts include the total of all impacts to a particular resource that have occurred, are occurring, and will likely occur as a result of any action or influence, including the direct and reasonably foreseeable indirect impacts of a Federal activity. Accordingly, there may be different cumulative impacts on different environmental resources. This is illustrated in Figure 1.

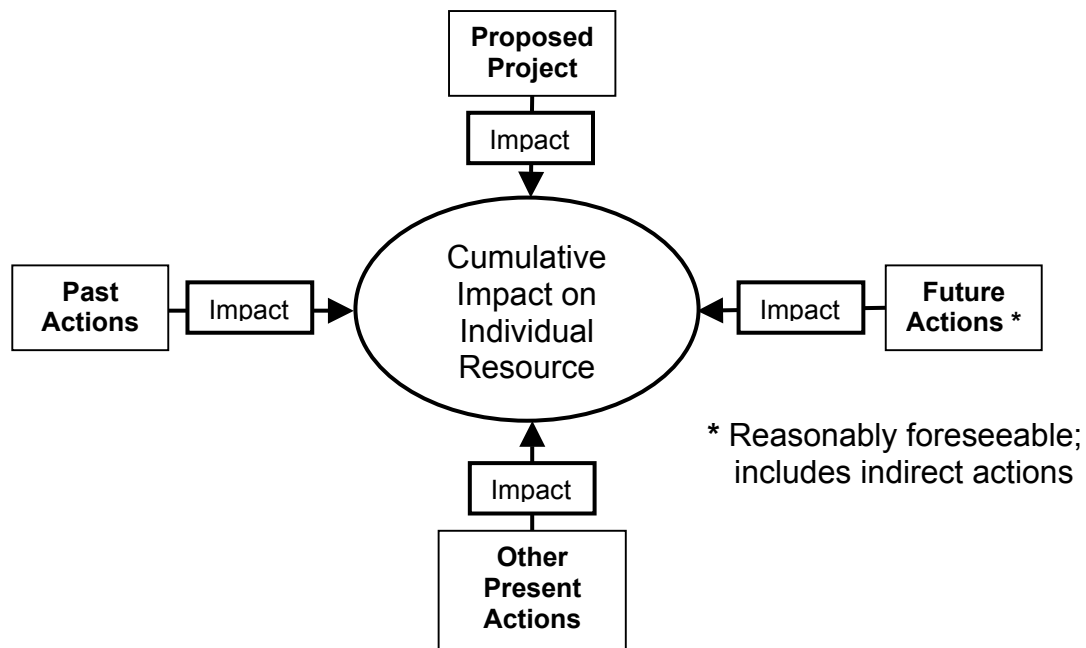
Cumulative impact analysis is resource specific and generally performed for the environmental resources directly impacted by a Federal action under study, such as a transportation project. However, not all of the resources directly impacted by a project will require a cumulative impact analysis. The resources subject to a cumulative impact assessment should be determined on a case-by-case basis early in the NEPA process, generally as part of early coordination or scoping.

Cumulative impact analysis may be thought of as a comparison of the past, present, and reasonable foreseeable health or condition of a specific resource as described in the following air quality example.

The air quality of an area today is in a measurable condition, relative to the National Ambient Air Quality Standards (NAAQS). In the past, perhaps recently, the quality of the air may have been worse, the same, or better than it is today depending on a number of factors such as automobile use, industry, residential development (fireplaces), and climatic conditions. Each of these individual factors may have influenced the positive or negative change in the air quality of the area. The condition of the air today is the result of these factors, which constitutes the past

effects of the cumulative impact question. Add the impacts of the proposed project, other occurring activities, and the positive and negative reasonably foreseeable impacts from any source (some of which may be indirect) and the result equates to the air quality cumulative impact.

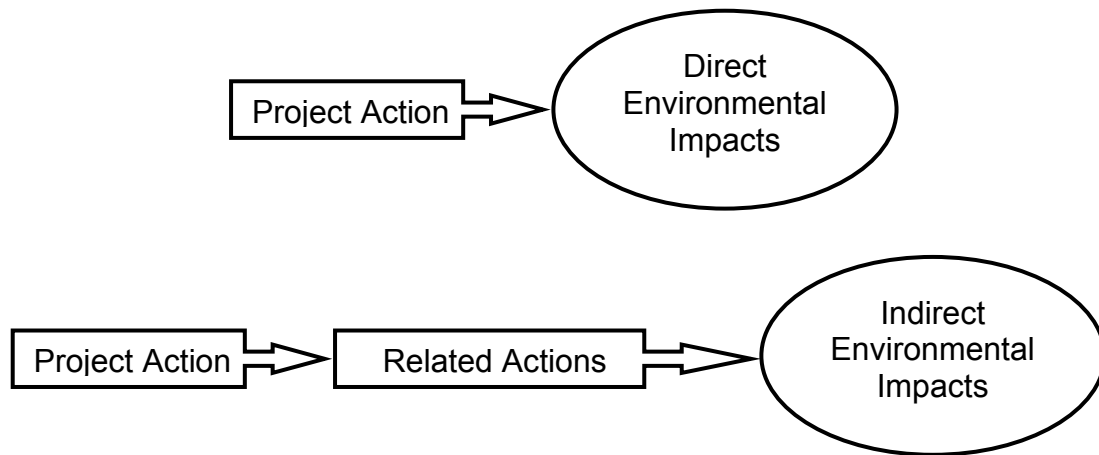
In the NEPA process, a similar consideration or analysis would be performed for other resources potentially impacted by the implementation of a proposed project.



**Figure 1. Cumulative Impact Diagram**

**Indirect impacts** as well as direct impacts, can be considered a subset of cumulative impacts, as illustrated in Figure 1., but are distinguished by an established cause and effect relationship to a proposed Federal action, such as a transportation project.

Figure 2. is an illustration and comparison of the cause and effect relationship of direct impacts and indirect impacts to a project action. As the name implies, direct impacts are those that are actually caused by project activities. Indirect impacts, on the other hand, are caused by another action or actions that have an established relationship or connection to the project. These induced actions are those that would not or could not occur except for the implementation of a project. These actions are often referred to as “but for” actions and generally occur at a later time or some distance removed from the original action.



**Figure 2. Direct and Indirect Impact Diagrams**

From the CEQ definition we find that indirect effects “may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems” (40 CFR § 1508.8). The key words in this explanation are “related” and “induced”.

Changes in land use patterns, growth or decline, in a given locale are attributable to many circumstances, events, and activities including Federal, non-Federal, and private actions. While transportation projects are not the only or primary factor in possible land use changes, the potential for certain transportation proposals to influence land use is undeniable. The same is true for other infrastructure improvements such as water supply, sewer, and/or utilities.

A proposal for a new alignment project in an area where no transportation facility currently exists, or one that adds new access to an existing facility may indicate the potential for project related indirect impacts from other distinct but connected actions. Likewise, the purpose and need of a proposed project that includes a development or economic element might establish an indirect relationship to potential land use change or other action with subsequent environmental impacts. The potential relationship of a transportation proposal to indirect impacts must be established on a case-by-case basis, early in the NEPA project development process.

**3. The CEQ regulations define indirect and cumulative impacts to include the effects of “reasonably foreseeable” actions. How is “reasonably foreseeable” defined and related to indirect and cumulative impact analysis?**

The determination or estimation of future impacts is essential to both indirect and cumulative impact analysis. However, the focus must be on reasonably foreseeable

actions, those that are likely to occur or probable, rather than those that are merely possible. For a better understanding of what reasonably foreseeable means in NEPA analysis, we turn our attention to court cases and decisions that have dealt with the adequacy of reasonably foreseeable analysis in the NEPA process.

In Dubois v U.S. Dept. of Agriculture, 102 F.3d 1273, 1286 (1<sup>st</sup> Cir 1996), the court concluded that when attempting to define indirect impacts, “the agency need not speculate about all conceivable impacts but it must evaluate the reasonably foreseeable effects of the proposed action.”

In Sierra Club v. Marsh, 976 F.2d 763, 767 (1st Cir. 1992), the court reviewed the issue of whether a particular indirect (secondary) impact was “sufficiently likely to occur, that a person of ordinary prudence would take it into account in making a decision”.

These cases indicate that indirect and cumulative impact analyses are appropriately concerned with impacts that are sufficiently “likely” to occur and not with the speculation of any impact that can be conceived of or imagined.

The CEQ guidance, *Questions and Answers About the NEPA Regulations*, also referred to as *Forty Most Asked Questions Concerning CEQ's NEPA Regulations*, 46 Fed. Reg. 18026 (March 23, 1981) (*40 Questions and Answers*), discusses the meaning of reasonably foreseeable. The answer to Question 18, in the CEQ guidance deals with the uncertainty of indirect impacts. This guidance also applies to cumulative impacts, since that definition uses the same reasonably foreseeable provision. The guidance states:

“The EIS must identify all the indirect effects that are known, and make a good faith effort to explain the effects that are not known but are “reasonably foreseeable.” (40 CFR §1508.8(b)). In the example, if there is total uncertainty about the identity of future land owners or the nature of future land uses, then of course, the agency is not required to engage in speculation or contemplation about their future plans. But, in the ordinary course of business, people do make judgments based upon reasonably foreseeable occurrences. It will often be possible to consider the likely purchasers and the development trends in that area or similar areas in recent years; or the likelihood that the land will be used for an energy project, shopping center, subdivision, farm or factory. The agency has the responsibility to make an informed judgment, and to estimate future impacts on that basis, especially if trends are ascertainable or potential purchasers have made themselves known. The agency cannot ignore these uncertain, but probable, effects of its decisions.”

From this we find that reasonably foreseeable events, although still uncertain, must be probable. This means that those effects that are considered possible, but not probable, may be excluded from NEPA analysis. There’s an expectation in the CEQ guidance that judgments concerning the probability of future impacts will be informed, rather than based on speculation.

The confident prediction of reasonably foreseeable impacts requires judgment based on information obtained from reliable sources. Coordination with local land use agencies and officials, including the review of adopted plans and similar instruments or documentation, if available, are important in this regard. Surveys and consultation with local landowners, developers, real estate agencies, or other individuals with special expertise within the proximity of the project study area can yield useful information. In a State, or region within a State, where growth management laws exist, the restrictions and requirements of those laws should be acknowledged and taken into consideration.

Potential changes in land use, development, or other reasonably foreseeable actions are not easy to predict. Estimates may be arrived at with surveys, discussions with appropriate local entities, the examination of trends, the use of sophisticated computer models or other appropriate methodology, such as the Delphi process. The Delphi method, modified Delphi method, or other “expert panel” approaches have been used to forecast reasonable foreseeable land uses for several recent transportation studies.

These or other methodologies may be appropriate for a given study, depending the type of project proposed, the geographic location, the resources involved, and other determining factors. Other important considerations include the existence of a formal planning process, local zoning regulations, land use codes or regulations, and other land use controls. Because project situations vary greatly, it is not possible to recommend a single methodology or standard approach that will be appropriate in every situation. This decision should be made on a case-by-case basis during early coordination or scoping.

Considerations related to selection of the most appropriate supporting methodology for a particular study should be coordinated with cooperating agencies and participants in the NEPA process during early coordination and scoping. Generally, the determination of an appropriate methodology for a given situation and project, should not need to be revisited, if the decision was made cooperatively and early in the NEPA process. It is recommended that every effort be made to reach agreement or consensus with project participants regarding the appropriate methodology, but it must be understood that the final decision is the responsibility of the lead agency. Courts in NEPA review have relied on the expertise of the lead Federal agency and have given considerable deference to their choice of technical experts and methodology, unless it can be shown there were obvious errors and omissions in the data supporting the agency’s decision.

**4. Since data and information is essential to determining reasonably foreseeable actions, what is our responsibility when specific essential information is unavailable or incomplete?**

The CEQ regulations (40 CFR § 1502.22) address Federal responsibility in situations where relevant information is either incomplete or unavailable related to the preparation of environmental impact statements:

- (a) If the incomplete information relevant to reasonably foreseeable significant adverse impacts is essential to a reasoned choice among alternatives and the overall costs of obtaining it are not exorbitant, the agency shall include the information in the environmental impact statement.
- (b) If the information relevant to reasonably foreseeable significant adverse impacts cannot be obtained because the overall costs of obtaining it are exorbitant or the means to obtain it are not known, the agency shall include within the environmental impact statement:
  - (1) a statement that such information is incomplete or unavailable;
  - (2) a statement of the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts on the human environment;
  - (3) a summary of existing credible scientific evidence which is relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment, and
  - (4) the agency's evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community. For the purposes of this section, "reasonably foreseeable" includes impacts which have catastrophic consequences, even if their probability of occurrence is low, provided that the analysis of the impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason.

The incomplete or unavailable information provision is recognition of the potential difficulty associated with obtaining essential and credible data necessary to complete the analysis of certain types of impacts in certain situations, especially for those actions that require the preparation of an EIS.

In situations where specific data is not available or is incomplete, this needs to be communicated to project participants and cooperating agencies as early as possible. This will enhance the opportunity for assistance in data collection and assist in reaching an understanding with participants concerning the availability and acceptability of relevant information.

## **5. What does NEPA expect of Federal Agencies with respect to indirect and cumulative impacts in the NEPA process?**

The NEPA legislation itself does not mention indirect or cumulative impacts. The CEQ regulations address Federal agency responsibility applicable to indirect and cumulative



impacts considerations, analysis, and documentation. We find reference to these impacts and requirements in the definition of the *scope* of a proposal (40 CFR § 1508.25) and in the content requirements for the *environmental consequences section* of an environmental impact statement (EIS) (40 CFR § 1502.16).

The scope of an action (40 CFR §§ 1500.4, 1501.1, 1501.7, and 1508.25) consists of the *range of actions* (connected or closely related, cumulative, and similar actions), *alternatives* (no action, other reasonable alternatives, and mitigation measures), and *impacts* (direct, indirect and cumulative impacts) to be considered in an EIS. For the study to be meaningful the project scope must not be too broadly or too narrowly defined, nor should it be focused on every issue that can be imagined but will likely have little relevance or influence on the project and environmental decisions contemplated in the NEPA study.

The environmental consequences section of an EIS (or EA) forms the scientific and analytical basis for the comparison of alternatives and includes discussion of the adverse impacts that cannot be avoided, including direct and indirect impacts, to support the comparison of alternatives (40 CFR § 1502.16). The CEQ regulations do not specifically mention cumulative impacts in the analysis and comparison of alternatives. Because direct and indirect impacts are caused by and related to project implementation, respectively, they represent the more substantive considerations in the alternatives development and analysis process, beyond the full disclosure and “hard look” provisions of NEPA.

Court cases have focused on the NEPA requirements related to the consideration and analysis of indirect and cumulative impacts. (see also the cases cited in the answer to Question 3).

Where cumulative impacts are concerned, one leading court in Fritiofson v. Alexander, 772 F.2d 1225 (5<sup>th</sup> Cir. 1985), addressed cumulative impact analysis using the following five-part evaluation:

- 1) What is the geographic area affected by the project?
- 2) What are the resources affected by the project?
- 3) What are the other past, present, and reasonably foreseeable actions that have impacted these resources?
- 4) What were those impacts?
- 5) What is the overall impact on these various resources from the accumulation of the actions?

Other courts have held that an evaluation must occur in the EIS if there are cumulative impacts. Muckleshoot Indian Tribe v. U.S. Forest Service, 177 F.3d 800 (9<sup>th</sup> Cir. 2001); Save the Yak v. Block, 840 F.2d 714 (9<sup>th</sup> Cir. 1988).

In City of Carmel v. U.S. Dept. of Transportation, 123 F.3d 1142 (9<sup>th</sup> Cir. 1997) the court held that an EIS must “catalogue adequately the relevant past projects in the

area." It must also include a "useful analysis of the cumulative impacts of past, present, and future projects." This means the EIS must analyze the combined effects of the actions in sufficient detail to be "useful to the decisionmaker in deciding whether, or how, to alter the program to lessen cumulative impacts."

Indirect and cumulative impact requirements of the CEQ regulations discussed here are generally related to actions requiring the preparation of an environmental impact statement (EIS). Indirect and cumulative impact analysis for projects processed with an environmental assessment (EA) or for categorical exclusion (CE) determinations should be considered commensurate with the potential for the project to involve these issues. Not all transportation project proposals will necessitate the same degree of indirect or cumulative impact consideration, analysis, or documentation as may be required and appropriate in an EIS. This is further discussed in the answer to *Question 7*.

**6. What are FHWA's specific policy and requirements regarding indirect and cumulative impact analysis in the NEPA process?**

The FHWA and Federal Transit Administration (FTA) NEPA implementing regulations, Environmental Impact and Related Procedures (23 CFR § 771), do not explicitly address cumulative or indirect impacts, with the exception of the definition for categorical exclusions (23 CFR § 771.117), which addresses potential significant impacts from cumulative CE actions. The adoption of NEPA principles and the process established in the CEQ regulations as the means of project development and environmental decisionmaking is apparent in these procedures. The FHWA regulations supplement the CEQ regulations with a clear reflection of NEPA's environmental policy and action forcing provisions in Section 771.105 Policy, Section 771.109 Applicability and responsibilities, and Section 771.111 Early coordination, public involvement and project development.

An appropriately thorough review of the probable direct and indirect impacts of FHWA actions and documentation of other cumulative effects on specific resources is essential to a reasoned and informed project decision and will assist in attaining FHWA's environmental streamlining and stewardship goals. Failing to adequately consider and document environmental impacts, commensurate with the potential for them to occur, can limit full compliance of essential NEPA requirements and could have serious implications in the ultimate quality of project decisions.

**7. Are indirect and cumulative impact consideration, analysis, and documentation requirements the same for categorical exclusions, environmental assessments, and environmental impact statements?**

No. Categorical exclusions (CE) and environmental assessments (EA) are intended for Federal agencies to comply with NEPA in those situations where the proposed action does not warrant the preparation of a detailed environmental impact statement (EIS). The consideration, documentation, and analysis requirements vary in degree by class of

action and should be commensurate with the potential for adverse and significant impacts, whether direct, indirect, or cumulative.

**Environmental impact statements** are the detailed documents required by NEPA (Section 102(2)(c)) and are prepared for major Federal actions that significantly impact the human environment (40 CFR §1508.11). Because actions requiring EISs will have significant environmental impacts, the consideration, analysis, and documentation of the **appropriate** issues must be reasonably detailed and disclosed as required by the CEQ regulations.

The level of analysis and documentation required for a specific EIS is primarily dependant on the potential for the action to cause adverse or significant environmental impacts and will vary by resource, project type, geographic location, and other factors. Actions processed with an EIS need to be carefully evaluated during the scoping process to determine the environmental resources, geographic boundaries, time periods, and methodologies to be used in analyzing indirect and cumulative effects.

**Categorical exclusions** apply to actions that do not have significant environmental effects (40 CFR § 1508.4, 23 CFR § 771.117(a)). A CE is not a document; it is a determination that an action is exempt from the requirement to prepare an EIS. The FHWA/FTA regulation provides two types of CEs based on the potential for adverse impacts (23 CFR § 771.117(c) and (d)). The level of detail required and documentation necessary for a particular CE depends on the group the action falls under. 23 CFR § 771.117(c) contains a list of 20 categories of actions that, based on FHWA's experience, never or almost never cause significant environmental impacts. These actions are automatically classified as CEs, except where unusual circumstances exist, and do not require the submittal of documentation to FHWA or individual approval. However, other environmental mandates or regulations with separate documentation requirements may apply.

The second list (23 CFR § 771.117(d)) includes 12 examples of actions that have a higher potential for impacts, but still meet the criteria for a CE. These types of actions are also based on FHWA's experience. Due to the higher potential for impacts, these actions require the submittal of appropriate documentation for the FHWA to determine if the CE classification is proper. The level of detail and documentation necessary should be commensurate with the action's potential for adverse environmental impacts. Many State DOTs have developed individual procedures that include acceptable level of detail and documentation requirements for various types of actions and impacts.

Since projects approved with CEs are generally minor in nature and have less than significant impacts, indirect and cumulative impacts assessments will generally not be warranted. There may be exceptions, which can be evaluated on a case-by-case basis.

**Environmental assessments** are prepared for actions that are not CEs and do not clearly require the preparation of an EIS. One of the primary purposes of an EA is to help the FHWA decide whether or not an EIS is needed and, therefore, should address

only those resources or features that have the likelihood to be significantly impacted. The EA should be a concise document that briefly provides sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact. It should not contain long descriptions, detailed information, or analyses (40 CFR §1508.9).

The degree to which indirect and cumulative impacts need to be addressed in an EA depends of the potential for the impacts to be significant and will vary by resource, project type, geographic location, and other factors. This issue should be addressed with other agencies and NEPA participants during early coordination activities or scoping.

## **8. Is documentation of indirect and cumulative impacts really necessary and important?**

Yes. Documentation, while perhaps not the single most essential element of the NEPA process, is important. As discussed in these *Questions and Answers*, the bulk of the provisions in the CEQ regulations regarding indirect and cumulative impact responsibilities are focused on adequate documentation in environmental impact statements (EIS).

The FHWA *Technical Advisory, T6640.8a, Guidance for Preparing and Processing Environmental and Section 4(f) Documents*, provides recommendations on the content, format, and processing of environmental impact statement (EIS) and environmental assessment (EA) documents. The *Technical Advisory* does not specifically address cumulative impacts and only discusses indirect impacts with respect to the farmlands, social impacts, coastal barriers, and energy sections of the environmental consequences chapter of an EIS (or EA). Nevertheless, the document needs to present a reasonably complete and accurate picture of the probable consequences involved in implementation of a proposed project, commensurate with the potential for adverse impacts and consistent with the provisions of the CEQ regulations.

The preparation of an environmental document not only addresses the public disclosure requirement, it ensures that the decisionmakers at the Federal, State and local levels will have adequate information to make an informed decision. The environmental document may also provide a basis for other decisionmakers, such as local officials, to understand the related and potential results of one alternative over another and take appropriate action to achieve environmentally desirable outcomes.

The environmental document, EIS or EA, may be the most visible, obvious, and scrutinized element of the NEPA process and it provides evidence of compliance with NEPA and other project development requirements. During NEPA litigation, the environmental document and administrative record will represent the proof of FHWA compliance with the NEPA process requirements, related requirements, and legal standards.

## **9. What is FHWA's legal authority to mitigate for environmental impacts identified in the NEPA process?**

NEPA does not specifically require substantive mitigation for project impacts; direct, indirect, or cumulative. Robertson v. Methow Valley Citizens Council, 490 U.S. 332, 350 (1989). However, the CEQ regulations require that the environmental impacts statement include consideration and discussion of possible mitigation for project impacts (40 CFR §§ 1502.14(f), 1502.16(e-h), 1505.2(c), 1508.25(b)(3)).

Questions 19a. and 19b. of the *CEQ 40 Questions and Answers* provide additional guidance on mitigation to be addressed and documented in the EIS:

"The mitigation measures discussed in an EIS must cover the range of impacts of the proposal. The measures must include such things as design alternatives that would decrease pollution emissions, construction impacts, esthetic intrusion, as well as relocation assistance, possible land use controls that could be enacted, and other possible efforts."

"All relevant, reasonable mitigation measures that could improve the project are to be identified, even if they are outside the jurisdiction of the lead agency or the cooperating agencies, and thus would not be committed to as part of the RODs of these agencies. This will serve to alert agencies or officials who can implement these extra measures, and will encourage them to do so. ... To ensure that environmental effects of a proposed action are fairly assessed, the probability of the mitigation measures being implemented must also be discussed. Thus the EIS and the Record of Decision should indicate the likelihood that such measures will be adopted or enforced by the responsible agencies."

Provisions regarding FHWA's legal responsibility and authority for mitigating project impacts are found in FHWA's Environmental regulations Section 771.105(d):

"Measures necessary to mitigate adverse impacts will be incorporated into the action and are eligible for Federal funding when the Administration determines that:

- (1) The impacts for which the mitigation is proposed actually result from the Administration action; and
- (2) The proposed mitigation represents a reasonable public expenditure after considering the impacts of the action and the benefits of the proposed mitigation measures. In making this determination, the Administration will consider, among other factors, the extent to which the proposed measures would assist in complying with a Federal statute, Executive Order, or Administration regulation or policy."

This provision reflects FHWA's responsibility to incorporate appropriate mitigation into transportation projects and provide the funding necessary to mitigate the impacts that

are actually caused by FHWA funded projects, provided the funding represents a reasonable public expenditure. Other factors to be considered in this determination include the resource impacted, the degree of harm to the resource by the project, the ability of the proposed mitigation to address the impact, whether or not the mitigation is possible, and if it is in the best overall public interest (23 USC 109(h)).

Mitigation for two specific types of highway impacts is addressed in separate FHWA regulations. 23 CFR § 777 addresses FHWA's authority for replacement of the loss of wetlands, natural habitat area, or functional capacity resulting from a Federal-aid project. 23 CFR § 772 deals with the abatement of highway traffic noise impacts. Neither provision specifically addresses mitigation for indirect or cumulative impacts of transportation projects. Determinations of appropriate mitigation for wetland impacts and highway noise abatement should be considered in the context of FHWA's mitigation authority, policy and the specific provisions of these subject regulations.

The FHWA and State DOTs may be called upon in some situations to make difficult decisions regarding commitments of certain mitigation measures that we do not have either the authority or responsibility to consider. It may be necessary in these situations, for FHWA to remind others of the lack of authority to commit Federal funds to the mitigation of impacts not attributable to transportation projects or the actions of others not within our direct control.

The complexity associated with the mitigation of indirect and cumulative impacts is addressed in the FHWA *Position Paper: Secondary and Cumulative Impact Assessment In the Highway Project Development Process*:

“After the analysis is complete a valid question will remain: If a proposed highway improvement is determined to cause potential secondary and cumulative effects, what can and should be done to mitigate the adverse impacts? This is a difficult question for which there are no simple solutions. Consistent with existing FHWA regulations mitigation proposals must be both reasonable and related to project impacts. However, the opportunities for environmental enhancement that are now available under the highway program may greatly expand our traditional view of mitigation. Changing a proposed transportation improvement to lessen its contribution of indirect impacts may likely result from a combination of mitigation and enhancement measures that address area-wide concerns, not just the immediate influence of the project. Unfortunately, measures that would be appropriate to offset most future developmental impacts in the area of a project often will be beyond the control and funding authority of the highway program. In these situations, the best approach would be to work with local agencies that can influence future growth and promote the benefits of controls that incorporate environmental protection into all planned development. “

In the spirit of environmental stewardship and support of FHWA's strategic goal to “protect and enhance the natural environment and communities affected by highway transportation”, we should seek opportunities to implement innovative measures that will

help our projects fit within the community and natural environment in which they are located. An example of such an opportunity is the integration of context sensitive design and solutions (CSS/CSD) within the NEPA and project development process. The context sensitive solutions approach is a collaborative, interdisciplinary approach that involves all stakeholders in the development of a transportation proposal so the project will fit in with the physical setting and preserve scenic, aesthetic, historic, and natural environmental resources, while maintaining safety and mobility.

It is important that we understand how mitigation is defined in the NEPA process. Replacement or compensation is the last of a sequence of considerations that constitute the overall mitigation expectation of the CEQ regulations (40 CFR § 1508.20). Mitigation includes avoidance and minimization of project impacts first. This hierarchy is often referred to as “sequencing” and means that impact avoidance and minimization measures should be considered early and as an integral component of the alternatives development and analysis process. Replacement or compensation for impacts are intended primarily to deal with residual impacts that cannot be avoided or minimized.

Mitigation that is included, as a commitment in the environmental document becomes an integral and essential part of the transportation project decision. FHWA’s responsibility regarding the implementation of mitigation measures identified as commitments in environmental documents is stipulated in 23 CFR § 771.109(b):

“It shall be the responsibility of the applicant, in cooperation with the Administration, to implement those mitigation measures stated as commitments in the environmental documents prepared pursuant to this regulation. The FHWA will assure that this is accomplished as a part of its program management responsibilities that include reviews of designs, plans, specifications, and estimates (PS&E), and construction inspections.”

#### **10. What specific strategies are most effective in addressing indirect and cumulative impacts and streamlining the project development process?**

Accurate environmental impact assessment is highly dependent on the use of appropriate methodology. It is generally recognized among Federal agencies and practitioners that specific methodologies for the assessment of indirect and cumulative impacts, particularly for predicting reasonable foreseeable impacts, are not as well established or universally accepted as those associated with direct impacts, such as traffic noise analysis and wetland delineation. Determining the most appropriate technique for assessing indirect and cumulative impacts of a specific project should include communication with the cooperating agencies and NEPA participants (See 40 CFR § 1503.3). For this reason and others, scoping and interagency coordination are important aspects of the NEPA project development process where cumulative and indirect impacts are a concern. Special attention should be given to these activities to improve our ability to address cumulative and indirect impact expectations and streamline project decisionmaking. Environmental documentation is another area worth

mentioning in this discussion. Small improvements in the overall quality of environmental documents can pay major dividends.

**Scoping.** The CEQ handbook, *Considering Cumulative Effects Under the National Environmental Policy Act (NEPA)* and the NCHRP Report 403, *Guidance for Estimating the Indirect Effects of Proposed Transportation Projects*, and NCHRP Report 466, *Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects* acknowledge the scoping process as essential to effectively incorporating indirect and cumulative effects into NEPA environmental assessment and analysis.

Scoping is an early and open process for determining the scope of issues, actions, alternatives, and impacts to be addressed in the NEPA study (40 CFR § 1501.7). NEPA studies are intended to be meaningful and focused on decisionmaking, which means the project scope should not be too broadly or too narrowly defined. The scoping process is intended to focus attention on the real issues and de-emphasize consideration of minor issues. This will appropriately narrow the scope of the environmental analysis on the issues that will have an influence on the decision or deserve attention from an environmental stewardship perspective.

The early participation of Federal, State agencies, local agencies, Indian Tribes, and in some cases the general public is essential to the NEPA process and should include attainment of the following outcomes and goals, especially where indirect and cumulative impacts are an issue. The items on the following list were derived from the CEQ cumulative impact guidance, NCHRP Report 403, the CEQ regulations, and the FHWA/FTA regulations. This list is provided as a guide:

- Identification and agreement on the roles and responsibilities of participants and cooperating agencies in the project development process;
- Identification of appropriate project study area;
- Complete inventory of features, resources, ecosystems, and human communities of concern within the project study or influence area;
- Clarification of major and important versus the minor issues associated with the proposed action and alternatives;
- Identification of other actions impacting or potentially affecting the major resources, ecosystems, and human communities;
- Definition of assessment goals, techniques, and methodology for analysis of identified potential effects;
- Establishment of appropriate resource geographic and temporal boundaries related to the identified scope of analysis;
- Identification of planning considerations in the local area, including directions and goals, land uses, and transportation plans for incorporation into the study
- Identification of initial alternatives to the proposal and to avoid and minimize harm to the environment.



The results of early coordination and the scoping process, which includes the definition of project scope (actions, alternatives and impacts), decisions on appropriate assessment methodologies, the extent or depth of analysis necessary, the timing of agency reviews, the project schedule, as well as other agreements and expectations, must be communicated to all involved agencies and the public as early as possible. This information should be included in the environmental document and administrative record. As lead Federal agency, FHWA should take special efforts to ensure, before indirect and cumulative impact studies are conducted, that cooperating agencies and key review agencies not object to the scope of review, including the specific methodology to be employed.

**Key references on scoping and scope in the CEQ Regulations include:**

- 1500.4 Reducing paperwork
- 1500.5 Reducing delay
- 1501.7 Scoping
- 1501.8 Time limits
- 1502.7 Page limits
- 1502.16 Environmental consequences
- 1506.5 Agency responsibility
- 1508.25 Scope

**Continued coordination.** The scoping process and early coordination should not be considered the only opportunity for agencies and the public to engage in the project study. Reasonable communication with cooperating agencies, participants, and the public, as appropriate, should be maintained throughout the project study. The need to revisit certain issues should be considered as additional or new information becomes available. Discussions concerning mitigation should commence as analysis and results allow. Every effort should be made to limit reconsideration or renegotiation of agreements with cooperating agencies and participants reached during scoping, such as the appropriate assessment methodology, temporal and spatial boundaries, and documentation review time frames.

**Documentation.** While documentation is not the end-all-be-all of the NEPA process, it is important that we do a reasonably good job of communicating the purpose and need of the project; the values used to develop and compare alternatives; the results of analysis for direct, indirect impacts, and cumulative impacts; and mitigation as required by relevant regulation. An environmental impact statement (EIS), or in some cases an environmental assessment (EA), may be the most obvious and scrutinized part of the NEPA process. It provides evidence to the public and participating agencies of our commitment to, and satisfaction of the NEPA requirements. Environmental documentation must communicate clearly the results of project analysis and the subsequent decisions.

We should be mindful of the fact that the adequacy of an EIS document is evidenced by a reasonably thorough discussion of the probable environmental consequences

of a proposal. The format and content must provide for informed decisionmaking and fully discuss the analysis and reasoning in choosing a particular course of action over another. There is an established relationship between adequate documentation and the project scope, in terms of detail. The environmental document should focus on the important concerns as opposed to trivial and minor issues. If a topic doesn't add value to the project decision, the related decisions of other agencies, or promote full disclosure, then it should only be briefly discussed or in some cases not included all.

The following are suggestions for improving and reducing the length of EIS documents taken from the CEQ regulations (40 CFR § 1500.4 Reducing paperwork):

- Set appropriate page limits (1501.7(b)(1) and 1502.7);
- Prepare analytic rather than encyclopedic environmental impact statements (1502.2(a));
- Briefly discuss the minor and less than significant issues (1502.2(b));
- Write in plain language (1502.8);
- Follow a clear format (1502.10);
- Emphasize the portions of the environmental impact statement that are useful to decisionmakers and the public (1502.14 and 1502.15);
- Reduce the emphasis on background material (1502.16);
- Focus on the important environmental issues identified in the scoping process (1501.7);
- Summarize the environmental impact statement (1502.12) and circulate the summary if the environmental impact statement is unusually long (1502.19);
- Incorporate information and data by reference (1502.21);
- Combine environmental documents with other documents (1506.4).

#### **11. Do other Federal environmental requirements include consideration and analysis of indirect and cumulative impacts?**

There are several environmental regulations, legislations, and authorities, in addition to NEPA that include indirect and cumulative impact requirements or general policies applicable to specific resource considerations. The following list is for illustration purposes and is not intended to be all-inclusive:

- **The regulations implementing Section 106 of the National Historic Preservation Act (NHPA)** require the consideration of indirect and cumulative impacts when applying the criteria of adverse effect on historic properties (36 CFR §800.5(a)(1)) and delineating the area of potential effects (APE) (36 CFR § 800.16(d)).
- **Section 404 of the Clean Water Act (CWA)** establishes a permitting program to regulate the discharge of dredged and filled material into waters of the United States, including wetlands. The basic requirement is that no discharge of

dredged or fill material can be permitted if a practicable alternative exists that is less damaging to the aquatic environment or if the nation's waters would be significantly degraded. Wetland impacts must be avoided where practicable and minimized. Any remaining unavoidable impacts must be compensated for by restoration and creation. The **Section 404 (b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material** (40 CFR § 230 subpart B) requires the CWA Section 404 permitting authority to determine the potential short- or long-term effects by determining the nature and degree of effect the proposed discharge will have, individually and cumulatively (230.11(a)(b)(c)(e)). Cumulative (230.11(g)) and secondary (230.11(h)) effects on the aquatic ecosystem must be considered as part of the Section 404(b)(1) analysis. The US Army Corps of Engineers regulatory responsibilities related to the issuance of Section 404 permits are addressed at **33 CFR § 325, Processing of Department of the Army Permits**.

- **The Federal Emergency Management Agency (FEMA) Regulations on Floodplain Management and Protection of Wetlands** requires the identification of potential direct and indirect adverse impacts associated with the occupancy, modification, and development of floodplains and wetlands. Such identification of impacts shall be to the extent necessary to comply with the requirements of **Executive Order 11988** (May 24, 1977, 42 FR 26951) and **Executive Order 11990** (May 24, 1977, 42 F.R. 26961) to avoid floodplain and wetland locations unless they are the only practicable alternatives and to minimize harm to and within floodplains and wetlands (44 CFR § 9.10).
- **50 CFR Part 402 Interagency Cooperation-Endangered Species Act of 1973, as Amended** requires the evaluation of direct, indirect, and cumulative effects on listed species and designated critical habitat of proposed federal actions (402.12, 402.14). Cumulative effects are defined (402.2) as “those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation”. Note that cumulative effects under ESA do not include past or future Federal actions. Indirect effects are included in the definitions (402.02) of Action, Destruction or adverse modification, Effects of the action, and Jeopardize the continued existence of.
- **The Farmland Protection and Policy Act implementing regulations, 7 CFR Volume 6, Part 658** applies to Federal or Federally assisted projects that may directly or indirectly and irretrievably convert farmland that is defined as: 1) prime, 2) unique, 3) other than prime or unique that is of statewide importance, or 4) other than prime or unique that is of local importance, to nonagricultural use.
- **FHWA Standards, 23 USC 109(l)(1)(b)** requires the evaluation of direct and indirect environmental and economic effects of any loss of productive agricultural land before the right-of-way on any Federal-aid highway can be used to locate a utility facility.

- **The Coastal Barrier Resources Act (CBRA)** designated various undeveloped coastal barrier islands for inclusion in the Coastal Barrier Resources System. Areas so designated were made ineligible for direct or indirect Federal financial assistance that might support development, including flood insurance, except for emergency life-saving activities.
- **Section 3-301(b) of Executive Order 12898 on Environmental Justice** states that whenever practicable and appropriate, Federal agency human health analyses must identify multiple and cumulative exposures to substantial environmental hazards.

## **12. What indirect and cumulative impacts guidance and training are available?**

There are several references related to indirect and cumulative impacts analysis and the NEPA process included in the attachment to these *Questions and Answers*. They include the Federal guidance on cumulative impacts issued by the Counsel on Environmental Quality (CEQ) and the Environmental Protection Agency (EPA), followed by the NCHRP reports for considering indirect impacts in transportation projects. Brief summaries of these documents are provided for information. FHWA's 1992, Position Paper is included in this list. Another list includes procedures and guidance developed by, or for specific State DOTs for indirect or secondary and cumulative impact analysis in the transportation decisionmaking process. Next is a list of currently available training opportunities and a brief list of select methodologies for your information. Additional information will be provided and maintained at the Re:NEPA Community of Practice website (<http://nepa.fhwa.dot.gov>).

## **Attachment - Indirect and Cumulative Impact References**

### **Federal Guidance**

- **Considering Cumulative Effects Under the National Environmental Policy Act (NEPA), Council on Environmental Quality, January 1997**

FHWA played a major role in the development of this 1997 guidance, which CEQ describes as a handbook. On October 23, 1997 FHWA distributed it to its field offices. The subject memorandum encouraged FHWA and State DOT's to use the handbook as a source of ideas for identifying and evaluating situations where cumulative impacts are important considerations. The handbook is recognized as a tool for practitioners in examining and documenting the effects to social, economic, and environmental resources. It outlines the general principles, presents useful steps, and provides an overview of a number of methods for conducting cumulative effects analysis. While, it is not formal guidance, exhaustive, or definitive, it will assist in developing study-specific approaches to cumulative impacts analysis.

October 23, 1997 Memorandum, is available at the FHWA Environment Guidebook, [www.fhwa.dot.gov/environment/guidebook](http://www.fhwa.dot.gov/environment/guidebook)

The handbook is available for downloading (in PDF) at the CEQ NEPANet website. [ceq.eh.doe.gov/nepa/ccenepa/ccenepa.htm](http://ceq.eh.doe.gov/nepa/ccenepa/ccenepa.htm)

- **Consideration Of Cumulative Impacts In EPA Review of NEPA Documents, U.S. Environmental Protection Agency, Office of Federal Activities (2252A); EPA 315-R-99-002, May 1999**

This guidance, while not expressly intended for Federal agencies use in carrying out cumulative impact analysis, includes information pertaining to the EPA's review of cumulative impact analysis in EISs. The guidance is intended to assist EPA reviewers of NEPA documents provide accurate, realistic, and consistent comments on the assessment of cumulative impacts focused on specific issues that are critical in EPA's review of NEPA documents under Section 309 of the Clean Air Act.

This document is available for downloading at the EPA NEPA website. [www.epa.gov/Compliance/resources/policies/nepa/index.html](http://www.epa.gov/Compliance/resources/policies/nepa/index.html)

Information on the CAA 309 review process can be found at the following website. [www.epa.gov/compliance/about/nepa.html](http://www.epa.gov/compliance/about/nepa.html)

## **NCHRP Reports**

- **Guidance for Estimating the Indirect Effects of Proposed Transportation Projects. NCHRP Report 403, Transportation Research Board, National Research Council. Prepared by the Louis Berger Group, 1998.**

This document presents the findings of research performed under NCHRP Project 25-10, "Estimating the Indirect Effects of Proposed Transportation Projects". The research was focused on various perspectives of definition, identification, and assessment of indirect effects on proposed transportation projects. The research included a review of environmental policy and NEPA implementation resources of transportation and environmental resource agencies, other related documentation, relevant case law, published literature, and environmental impact statements. Interviews with transportation and resource agency personnel involved in the preparation and review of EISs were also included. The guidance establishes an analysis framework for identification and assessment of indirect effects for transportation projects.

The report can be ordered online at Transportation Research Board (TRB) Bookstore: [www.nationalacademies.org/trb/bookstore/](http://www.nationalacademies.org/trb/bookstore/)

- **Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects. NCHRP Report 466, Transportation Research Board, National Research Council. Prepared by the Louis Berger Group, 2002.**

This report is based on the results of research carried out under NCHRP Project 25-10(02), "Continuation: Estimating the Indirect Effects of Proposed Transportation Projects." The objectives of this project focused on the update of *NCHRP Report 403, Guidance for Estimating the Indirect Effects of Proposed Transportation Projects* and to provide training materials related to the use of Report 403. The Desk Reference contains a synthesis of regulations, case law, published literature, EIS content, and practitioner experience in indirect effects analysis and documentation. It discusses a framework for identifying and analyzing indirect impacts of transportation projects. Appropriate tools and techniques are also referenced. The Desk Reference is supported by a course curriculum that provides instruction on applying the techniques of Report 403.

The Desk Reference is available (in PDF format) at the following website: [gulliver.trb.org/publications/nchrp/nchrp\\_rpt\\_466.pdf](http://gulliver.trb.org/publications/nchrp/nchrp_rpt_466.pdf)

The Desk Reference can be ordered online at Transportation Research Board (TRB) Bookstore: [www.nationalacademies.org/trb/bookstore/](http://www.nationalacademies.org/trb/bookstore/)

## **FHWA Guidance**

- **Position Paper: Secondary and Cumulative Impact Assessment In the Highway Project Development Process. FHWA, 1992**

The position paper represents the first and only formal guidance issued by FHWA until the release of this interim guidance. It provides a basic orientation to the subject and suggests a decisionmaking framework of 8 general concepts for incorporating secondary and cumulative impact considerations into the highway project development process.

Available at the FHWA Environmental Guidebook website  
[www.fhwa.dot.gov/environment/guidebook/index.htm](http://www.fhwa.dot.gov/environment/guidebook/index.htm) or

## **State Procedures**

- **Guidance for Assessing Indirect and Cumulative Impacts of Transportation Projects in North Carolina, November 2001**

Contact: Gail Grimes, [ggrimes@dot.state.nc.us](mailto:ggrimes@dot.state.nc.us) or 919-733-7844 ext. 323

- **Maryland State's Highway Administration's Secondary and Cumulative Effects Analysis Guidelines for Environmental Impact Statements and Environmental Assessments**

<http://www.sha.state.md.us/oppe/scea/index.htm>

Contact: Gay Olsen, [golsen@sha.state.md.us](mailto:golsen@sha.state.md.us) or 410-545-8504

- **A Guidebook for Evaluating the Indirect and Cumulative Growth Impacts of Highway Improvements, Final Report, SPR 327, ECONorthwest and Portland State University for Oregon Department of Transportation, and the Federal Highway Administration, April, 2001**

<http://www.odot.state.or.us/tddresearch/reports/guidebook.pdf>

Contact: Alan R. Kirk, [Alan.R.Kirk@odot.state.or.us](mailto:Alan.R.Kirk@odot.state.or.us) or 503-986-4130

- **Secondary and Cumulative Environmental Impacts of Transportation Projects; Florida Atlantic University/Florida International University Joint Center for Environmental and Urban Problems, FL-ER-70-98**

Contact: Win Lindeman, [win.lindeman@dot.state.fl.us](mailto:win.lindeman@dot.state.fl.us) or 850-410-5886

- **Indirect and Cumulative Effects Analysis for Project-Induced Land Development, Technical Reference Guidance Document, Wisconsin Department of Transportation.**

Contact: Susan Fox, [susan.fox@dot.state.wi.us](mailto:susan.fox@dot.state.wi.us) or 608-267-4473

## **Training**

- **Environmental Impact Training (EIT) - Cumulative Effects Assessment**

This 3-day course focuses on the principles and practices for incorporating cumulative effects considerations in the environmental impact assessment (EIA) process. The substantive topics addressed include principles and procedures, determining spatial and temporal boundaries, defining baseline conditions, delineation of reasonably foreseeable future actions, use of methods for identifying cumulative effects, incorporating cumulative impact considerations in the scoping process, and examples of cumulative effects prediction methods. Special attention is given to case studies for defining lessons learned. Dr. Larry Canter and Dr. Sam Atkinson are the principal instructors.

Information: <http://www.eiatraining.com/index.htm>

- **Environmental Planning Strategies, Inc. - Conducting Quality Cumulative Impact Analyses under the National Environmental Policy Act (NEPA)**

This interactive 2-3 day workshop is highly tailored to the sponsoring Federal and State agency. The training focuses on conducting effective and practical NEPA cumulative impact analyses; selecting the proper scope of analysis; developing an appropriate baseline; and incorporating correct past, present, and reasonably foreseeable future actions. Participants systematically discuss cumulative impacts analysis cases within the framework of NEPA, the CEQ regulations, CEQ guidance, EPA guidance, and legal precedent.

Information: Judith Lee, [Jleeeps@mchsi.com](mailto:Jleeeps@mchsi.com) at 563-332-6870.

- **Duke University - Accounting for Cumulative Effects in the NEPA Process**

This two and one-half day workshop is a review of cumulative effects concepts and principles, scoping techniques, baseline conditions, information sources, and methods for effects identification and prediction.

Information: <http://www.env.duke.edu/cee/coursesNEPAeffects.html>



- **NCHRP Report 466 Desk Reference for Estimation the Indirect Effects of Proposed Transportation Projects and supporting slide presentation.**

The Desk Reference mentioned above in guidance is supported by a curriculum for providing instruction on the techniques of Report 403. The report and supporting slide presentation should be of interest to FHWA, State DOTs and others, as a resource for transportation planners and engineers, environmental practitioners responsible for project development and environmental impact analysis. The course curriculum is free and available on the Internet. The Louis Berger Group authored the NCHRP reports and delivered this training.

Contact: Larry Pesesky, [lpesesky@louisberger.com](mailto:lpesesky@louisberger.com) at 973-678-1960 ext. 487

Materials available at: [www.4.trb.org/trb/crp.nsf](http://www.4.trb.org/trb/crp.nsf).

- **Workshop on Methods for Evaluating Secondary and Cumulative Land Use Impacts.**

The FHWA and the New England Region of the Environmental Protection Agency are co-sponsoring one-day workshops that will present successful methods used to evaluate secondary and cumulative land use impacts of transportation projects. Included in the workshop will be a review of the available methods, guidelines for selection of methods, and a case study on expert panels. The initial offerings will be held February 25, 26, and 27, 2003 in Albany, NY, Hartford, CT, and Boston, MA, respectively. Future course offerings will be considered

Contact: Katherine Still, [still@pbworld.com](mailto:still@pbworld.com),

### **Select Related References**

- U.S. EPA, 2000. Projecting Land-Use Change: A Summary of Models for Assessing the Effects of Community Growth and Change on Land-Use Patterns. EPA/600/R-00/098. U.S. Environmental Protection Agency, Office of Research and Development, Cincinnati, OH. 260 pp.

<http://www.epa.gov/ecocommunity/tools/reportfinal3.pdf>

- U. S. EPA, 2000. Our Built and Natural Environments: A Technical Review of the Interactions between Land Use, Transportation, and Environmental Quality. EPA/231/R-01/002. U.S. Environmental Protection Agency, Development, Community, and Environment, Washington, DC 20460

<http://www.smartgrowth.org/library/built.html>

- The Use of Expert Panels in Analyzing Transportation and Land Use Alternatives. Transportation Research Board, National Research Council. Prepared by Parsons Brinckerhoff Quade and Douglas, Inc. for FHWA National Cooperative Highway Research Program. (Report Pending)
- Land Use Impacts of Transportation: A Guidebook. NCHRP Report 423A Transportation Research Board, National Research Council. Prepared by Parsons Brinckerhoff Quade and Douglas, Inc., and Daniel K. Boyle of Transportation Management and Design. Prepared for FHWA National Cooperative Highway Research Program, 1999, 165pp.

Available from the Transportation Research Board (TRB) Bookstore:  
<http://www.nationalacademies.org/trb/bookstore>

Website: <http://www.nas.edu/trb>

- Guidebook for Assessing the Social and Economic Effects of Transportation Projects, NCHRP Report 456. Transportation Research Board, National Research Council. Prepared by David J. Forkenbrock, Public Policy Center, University of Iowa, Iowa City, IA and Glen E. Weisbrod, Economic Development Research Group, Boston, MA Prepared for FHWA National Cooperative Highway Research Program, 2001, 242pp.

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<http://www.nationalacademies.org/trb/bookstore/>

Available online: <http://www4.trb.org/trb/crp.nsf/All+Projects/NCHRP+25-19>

- Issues in NEPA Litigation, William M. Cohen, Adjunct Professor and Consultant, Washington College of Law, American University, Washington, DC

[http://www.naep.org/NEPAWG/NEPA\\_Issues\\_1.html](http://www.naep.org/NEPAWG/NEPA_Issues_1.html)

- Toolbox for Regional Policy Analysis Website, Developed for the Federal Highway Administration, and Federal Transit Administration by Cambridge Systematics, Inc.

<http://www.fhwa.dot.gov/planning/toolbox/index.htm>

- FHWA Context Sensitive Solutions Website

<http://www.fhwa.dot.gov/csd/102902.htm>

- FHWA Flexibility in Highway Design Web Document

<http://www.fhwa.dot.gov/environment/flex/index.htm>